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ABSTRACT

Jerome Kagen, who developed instruments to measure and classify the aspect of man's psychological make-up known as conceptual tempo, generated 3 conceptual tempos: reflective, impulsive, and neutral. These tempos are determined by measuring latency time (time lapse) from stimulus to first response and recording the number of errors made. In this 1968 study, 6 null hypotheses were tested using 18 migrant children aged from 4.5 to 14.2 years. Purpose of the study was to determine what effect, if any, the A Blocks treatment (a sub-unit of the Attribute Games and Problems unit) has on conceptual tempo. Of more specific interest was the effect of treatment upon enhancing reflectivity through modification of an impulsive tempo in migrant children. Control and treatment groups were set up wherein the examiner-teacher was permitted to guide the treatment group through a part of the A Blocks test; however, control group students had no directed activity but were allowed to converse with the examiner during the activity. It appears that if one's goal is to increase latency time between stimulus and initial response, the method used with the control group generates the most positive trend. The general conclusion was that the A Blocks portion of the Attribute Games and Problems unit does not enhance reflectivity of migrant children as measured by latency time and number of errors. (EL)

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A STUDY OF THE POSSIBLE IMPROVEMENT OF PROBLEM SOLVING ABILITY IN MIGRANT CHILDREN

Submitted by:

JAMES O. SCHNUR

[1968]

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INTRODUCTION

In recent years inroads have been made into a relatively unexplored area of man's psychological make-up which has come to be known as conceptual tempo. One of the most notable pioneers who has emerged is Jerome Kagan. He has developed instruments by which conceptual tempo can be measured and classified. These tests, along with his numerous studies, have made valuable contributions to the understanding of this trait.

Kagan generated three conceptual tempos: reflective, impulsive and neutral. These are determined by measuring latency time (time lapse) from stimulus to first response and recording the number of errors made in the Kagan conceptual measurement instruments. Kagan has developed two tests for measuring conceptual tempo: the Matching Familiar Figures Test and the Haptic Visual Matching Test. The reflective subject is above the median (for his group) on response time and below the median on the total number of errors made. The impulsive subjects are below the median in response latency time and above the median on total number of errors. Subjects not fitting into those two classifications are neither clearly reflective nor impulsive.[1]

Kagan elaborated upon the relationship between problem solving and impulsive-reflectivity. He listed the four following relationships:

1. Reflection is critical to ease of solution and success in problem solving.
2. If alternatives are not reflected upon, in terms of differential validity, the student is apt to implement mentally to the first idea that occurs to him.
3. Impulsivity has a higher probability of failure.
4. An incorrect pattern of problem solving, for example: problem presentation...impulsive selection of invalid solution... failure...anxiety...selection of a second invalid solution... failure...and so on, may further the child's gradual withdrawal from involvement in problem situations and he becomes apathetic or hostile toward intellectual situations.[2]

There are no definite cause-effect relationships that can be applied to the particular conceptual tempo emergence in a subject. Reflectivity or the lack of it, may be the result of constitutional predispositions; the degree of involvement in tasks and/or the expectation of failure. The more anxious child may, for example, fear the silence that follows the spoken question and will answer impulsively to break this silence. Kagan has observed that the impulsive subject: (1) reports the first hypothesis that occurs to him; (2) responds incorrectly quite often; (3) is minimally concerned about mistakes. The reflective subject typically: (1) delays longer before answering; (2) usually makes correct responses; (3) demonstrates behavior designed to avoid error, and thus inhibits incorrect hypotheses.[3]

The impulsive youngster has a definite school handicap. Most teachers do not have a high tolerance for incorrect replies. Peer groups are prone to jeer the impulsive youngster for his incorrectness. It would appear that modifying an impulsive subject to become more reflective would increase the subject's probability of school success. Kagan has demonstrated that he was able to significantly lengthen response time through training.[4]

One of the units developed by the Elementary Science Study, namely, Attribute Games and Problems, is concerned with thinking skills in children. This unit was designed to provide an opportunity for children to deal with problems involving classification and the relationship between classes. Such experiences can help provide the familiarity and the skill necessary for solving problems in science, social studies, mathematics, or wherever classification and dealing with the relations between classes are called for. This is the claim made by E.S.S.[5]

The unit consists of four sub-units: A Blocks; Color Cubes; People Pieces; and Creature Cards. It is suggested that it is best to begin with A Blocks.

A Blocks consists of: thirty-one guide cards (procedural); three-dimensional, colored, geometric shapes; classification cards; and a set of group boundary elastics.

PURPOSE

The purpose of this study was to determine what effect, if any, the A Blocks treatment would have upon conceptual tempo. Of more specific interest was the investigation of the effect of treatment upon enhancing reflectivity through the modification of an impulsive tempo in migrant children.

SAMPLE

The sample group included in this study consisted of eighteen migrant children. The term "migrant children", as used herein, refers to the children of migrating, seasonal crop harvesters. There were eleven male subjects and seven female subjects. The subjects ranged in chronological age from approximately 4.5 to 14.2 years. Age could, for the most part, only be approximated, as valid records were often lacking and parental information, when available, was for the most part, quite vague. These subjects were enrolled as students in the 1968 Summer Workshop at the New York State Center for Migrant Studies, State University College, Geneseo, New York.

PROCEDURE

The eighteen subjects in the sample were randomly assigned to either the control group or the treatment group. An examiner-teacher was assigned to each subject. This teacher-student ratio applied to the treatment and control group as well. There were nine subjects so assigned to each group.

In the control group the subjects were allowed to color, draw, or paint

for a thrity minute period. The examiner-teacher was allowed to converse with the subject but was not to direct the activity during the period in any way. There was no effort to match the subject and examiner-teacher as to sex.

In the treatment group, the examiner-teacher guided the subject through one A Blocks procedural card each period. The examiner-teacher was allowed to interact with the subject and stimulate the subject's investigation of related materials within the scope of the given card.

The control and treatment groups participated in six sessions during the duration of the workshop. The treatment group was able to complete the first six procedural cards of the A Blocks Unit. This appears to be in keeping with the intent of E.S.S. as expressed in the unit manual for the Attribute Games and Problems. It is suggested that segmentation may be desirable and is allowable.

The testing procedure consisted of the administration of Form 1 and Form 2 of Kagan's Matching Familiar Figures Test. Form 1 was administered as a pre-test on the first day of the study. Form 2 was administered as a post-test on the last day of the study.

TREATMENT OF DATA

The "t test" was used to analyze the data in this study. It was used to test the significance of difference of the pre-test and the post-test of each group. The "t test" was also used to test the significance of difference between the post-test results of the two groups when compared to each other. Fisher's Exact Test was employed to determine if a significant association existed between the treatment and the conceptual tempo, reflectivity.

RESULTS

Six null hypotheses were tested. The .05 level of confidence was selected for accepting the null hypotheses.

The first null hypothesis tested was: There is no significant difference in latency time between the means of the difference scores of the pre and post Matching Familiar Figures Test of the control group.

The "t test" for related measures was applied to the differences in latency time, measured to the nearest half-second. This yielded a t-value of 1.274 with eight degrees of freedom. This value is less than the 2.306 t-value with eight degrees of freedom which represents the critical value of "students" t statistic at the .05 level of significance for non-directional tests. Therefore, the first null hypothesis was not rejected.

The second null hypothesis tested was: There is no significant difference in latency time between the means of the difference scores of the pre and post Matching Familiar Figures test of the treatment group.

Here also the "t test" for related measures was applied to the differences in latency time as was done in testing hypothesis one. A t value = 1.457 with eight degrees of freedom was generated for the treatment group. This also was less than the critical value at the .05 level of significance for a non-directional test. Therefore, hypothesis two was not rejected.

The third null hypothesis tested was: There is no significant difference in errors between the means of the difference scores of the pre and post Matching Familiar Figures Test of the control group.

The t value generated by the "t test" for related measures for this date was 1.973 with eight degrees of freedom. This is less than the critical value of t = 2.306 with eight degrees of freedom necessary to reject the null hypothesis at the .05 level of significance for non-directional tests.

Therefore, hypothesis three was not rejected.

The fourth null hypothesis tested was: There is no significant difference in errors between the means of the difference scores of the pre and post Matching Familiar Figures of the treatment group.

The t-value generated by the "t test" for related measures was 1.352 with eight degrees of freedom. As in hypothesis three, this was below the critical value at the .05 level for non-directional tests. Therefore, hypothesis four was not rejected.

The fifth null hypothesis tested was: There is no significant difference between the Matching Familiar Figures post-test latency time means of the control and treatment groups.

The "t test" for two independent means were used to analyze this data. The t-value generated was .363 with sixteen degrees of freedom. This was less than the critical value of 2.120 with sixteen degrees of freedom at the .05 level of significance for non-directional tests. Therefore, hypothesis five was not rejected.

The sixth null hypothesis tested was: There is no significant difference between the Matching Familiar Figures post-test error means of the control and treatment groups.

The "t test" for comparing two independent means was applied to this data and generated a t-value of 3.129 with sixteen degrees of freedom. This value was greater than the critical value of 2.120 with sixteen degrees of freedom at the .05 significance level for non-directional tests. Therefore, hypothesis six was rejected.

Fisher's Exact Test was used to analyze the conceptual tempos generated by the post-testing with the Matching Familiar Figures Test. The M.F.F. test identified two reflectives and three impulsives in the treatment group. In the

control group the M.F.F. test identified three reflectives and two impulsives. These results are shown in the following table:

Post-test M.F.F.

	Treatment	Control
Reflective	a 2	b 3
Impulsive	c 3	d 2

This 2-3-3-2 distribution generated the value.132 which is greater than the .05 level. As a result, it must be concluded that there is no significant association between the rows (conceptual tempos) and the columns (treatment, control).

CONCLUSIONS

The results of this study seem to support the conclusion that the A Blocks treatment did not significantly lengthen the latency time of the treatment group. Upon examining the pre-test latency time mean of the treatment group. (339.44) and this group's post-test latency time mean (274.55), it can be seen that latency time actually decreased. The mean latency time of the control group (pre-test: 260.22 and post-test: 288.22) showed a lengthening trend, although this trend was not significant at the .05 level.

The A Blocks treatment also did not significantly reduce the mean number of errors committed on the Matching Familiar Figures Test (pre-test mean: 21.55 and post-test mean: 26.00). It can be observed that the mean number of errors increased from 10.88 on the pre-test to 16.88 on the post-test for the control group. This was a slightly greater increase than that noted for the treatment group.

It appears that if one's goal is to increase the latency time between stimulus and initial response in migrant children, the method used with the control group generates the most positive trend. This might lead one to hypothesize that a more therapeutic approach to working with migrant children tends toward making them slightly more reflective, at least with regard to latency time. It will be recalled that the migrant children in the control group were free to color and interact with their "teachers" on a one-to-one basis. The situation in which the teacher was guiding the child through the A Block levels did not yield this positive trend. There are several possible explanations for these results: This may have represented a more negative, stressful situation; the A Block treatment may not have been of long enough duration. It also occurred to the study director that the figures in the Matching Familiar Figures Tests were less well known and thus less familiar to migrant children than to children of a more "average" experiential background. Such possibilities as these point toward the necessity for more study in this area.

To summarize, the general conclusion generated by this study is: The A Blocks portion of the Elementary Science Study's Attribute Games and Problems unit does not enhance the reflectivity of migrant children as measured by latency time and number of errors.

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